1.33) Low pass attenuates by 6dB $V_{out} = \frac{1}{2} V_{in}$

$$V_{out} = \frac{V_{in}}{(1+\omega^2R^2C^2)^{\frac{1}{2}}}$$

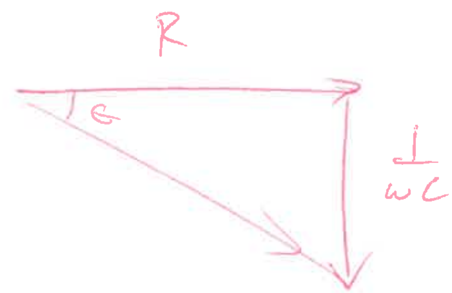
$$\left(\frac{1}{2}\right)^2 = \frac{1}{1+\omega^2R^2C^2}$$

$$\left(\frac{1}{4} + \frac{1}{4}\omega^2R^2C^2 = 1\right)4$$

$$\omega^2R^2C^2 = 3$$

$$(2\pi)^2 f^2 R^2 C^2 = 3$$

$$f = \frac{\sqrt{3}}{2\pi RC}$$



$$\tan \theta = \frac{1}{\omega CR} = \frac{1}{2\pi f CR}$$

$$\theta = \tan^{-1} \frac{1}{\sqrt{3}} = 30^\circ$$

RC high pass handout

1.) $X_c = \frac{1}{\omega C}$ 10Hz : $3.2\times10^4\ \Omega$ 100kHz : 3.2Ω 10MHz : 0.032Ω 1kHz : 320Ω

$C = 0.5\mu F$

2) $X_c = \frac{1}{\omega C}$ 10Hz : 0.06V 1kHz : 1.5V 100kHz : 2V 10MHz : 2V

$$V_{out} = \frac{R}{R+X_c} V_{in}$$

3) $f_{3dB} = \frac{1}{2\pi RC} =$ 318Hz